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(54) Abstract Title
Financial transaction method and system

(57) A financial transaction system comprises a hand held computer 10 in electronic communication with a store computer 20 which is itself in electronic communication with at least one financial institution computer 30, 32, 34. At least two substantially simultaneous electronic financial transactions may be performed between at least two financial accounts of the user of the hand held microcomputer and a store account. The hand held microcomputer is substantially immediately provided with updated account information after the electronic financial transactions have been completed.

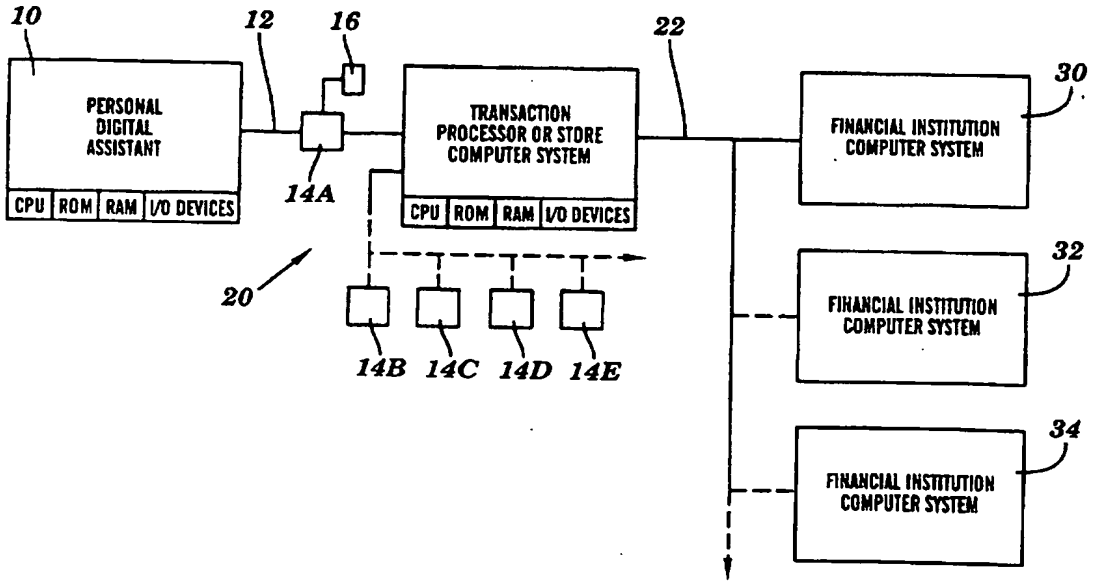

FIG. 1

GB 2 347 257 A

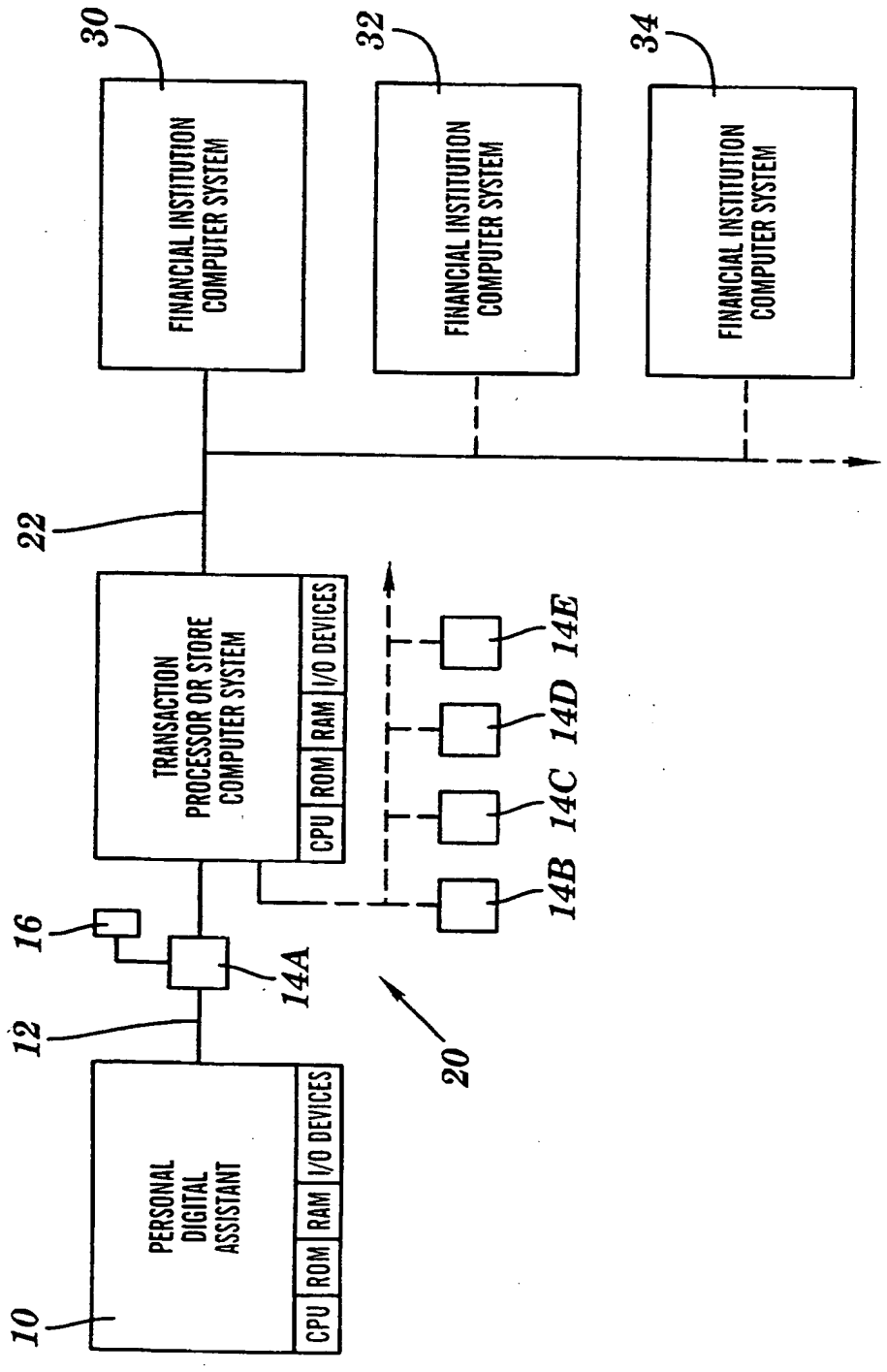
30
FINANCIAL INSTITUTION COMPUTER SYSTEM
32
FINANCIAL INSTITUTION COMPUTER SYSTEM
34
FINANCIAL INSTITUTION COMPUTER SYSTEM
22
TRANSACTION PROCESSOR OR STORE COMPUTER SYSTEM
CPU
ROM
RAM
I/O DEVICES
14B
14C
14D
14E
16
14A
12
20
PERSONAL DIGITAL ASSISTANT
CPU
ROM
RAM
I/O DEVICES
10

FIG. 1

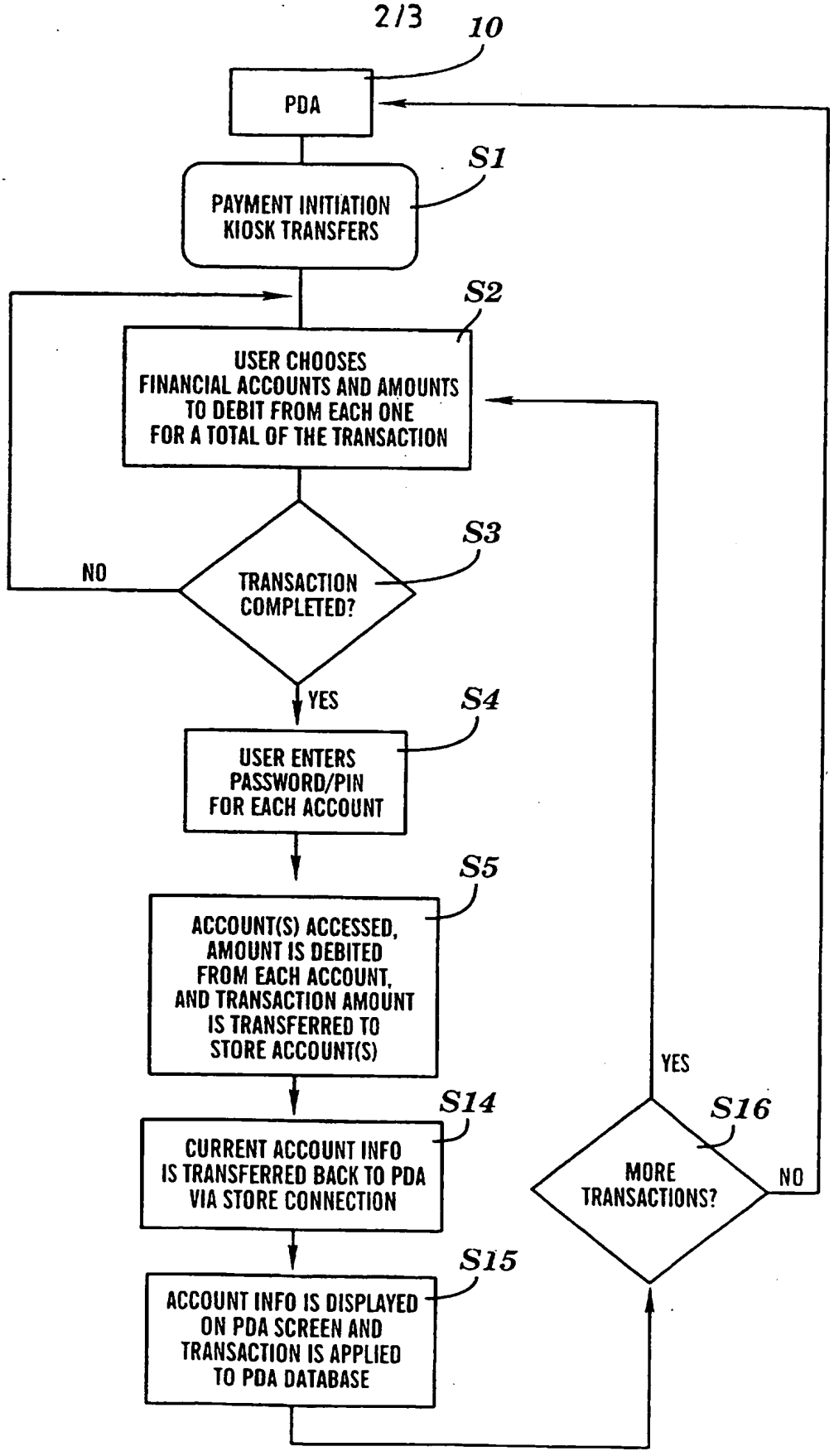
10
PDA
S1
PAYMENT INITIATION KIOSK TRANSFERS
S2
USER CHOOSES FINANCIAL ACCOUNTS AND AMOUNTS TO DEBIT FROM EACH ONE FOR A TOTAL OF THE TRANSACTION
S3
TRANSACTION COMPLETED?
NO
YES
S4
USER ENTERS PASSWORD/PIN FOR EACH ACCOUNT
S5
ACCOUNT(S) ACCESSED, AMOUNT IS DEBITED FROM EACH ACCOUNT, AND TRANSACTION AMOUNT IS TRANSFERRED TO STORE ACCOUNT(S)
S14
CURRENT ACCOUNT INFO IS TRANSFERRED BACK TO PDA VIA STORE CONNECTION
S15
ACCOUNT INFO IS DISPLAYED ON PDA SCREEN AND TRANSACTION IS APPLIED TO PDA DATABASE
S16
MORE TRANSACTIONS?
YES
NO

FIG. 2

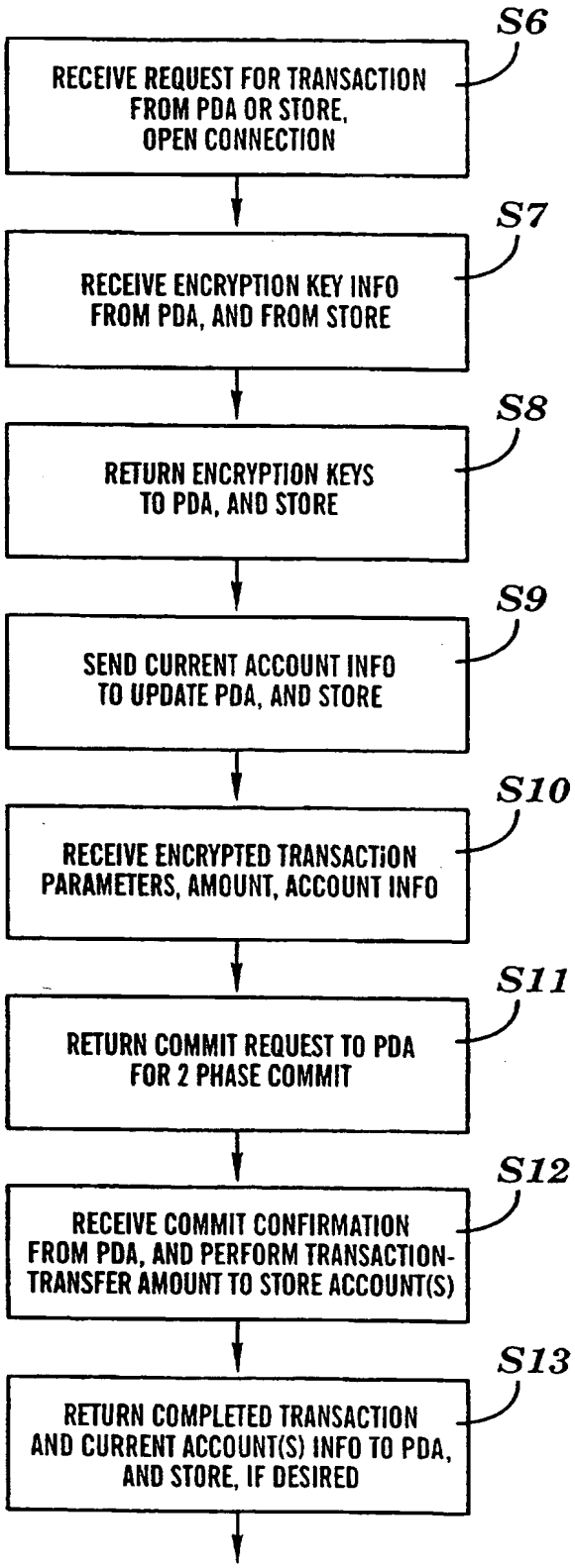
S6
RECEIVE REQUEST FOR TRANSACTION FROM PDA OR STORE, OPEN CONNECTION
S7
RECEIVE ENCRYPTION KEY INFO FROM PDA, AND FROM STORE
S8
RETURN ENCRYPTION KEYS TO PDA, AND STORE
S9
SEND CURRENT ACCOUNT INFO TO UPDATE PDA, AND STORE
S10
RECEIVE ENCRYPTED TRANSACTION PARAMETERS, AMOUNT, ACCOUNT INFO
S11
RETURN COMMIT REQUEST TO PDA FOR 2 PHASE COMMIT
S12
RECEIVE COMMIT CONFIRMATION FROM PDA, AND PERFORM TRANSACTION-TRANSFER AMOUNT TO STORE ACCOUNT(S)
S13
RETURN COMPLETED TRANSACTION AND CURRENT ACCOUNT(S) INFO TO PDA, AND STORE, IF DESIRED

FIG. 3

FINANCIAL TRANSACTION METHOD AND SYSTEM

The present invention relates to financial electronic transactions.

Heretofore, credit cards, automated teller machine (ATM) cards and socalled smart cards have been used to purchase products and services without the use of cash. These cards suffer from a number of disadvantages. First, they do not provide the ability to use multiple accounts to pay for a transaction. Second, they do not provide feedback for record keeping other than a purchase receipt. The card user, therefore, must remember to enter the amount of purchases into his/her account register and update the account balance. Balance maintenance and budgeting, therefore, are burdensome.

It is an object of the invention to provide a financial transaction system and method in which these disadvantages are avoided or reduced.

This object is met by the invention claimed in claims 1 and 11.

An embodiment of the invention will now bw described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram of a hardware environment embodying the present invention;

Fig. 2 shows a flow diagram of the process operated on the hardwar of Fig. 1; and

Fig. 3 shows a flow diagram of financial institution processes.

In the present specification a "personal digital assistant" (PDA) means a hand held microcomputer designed for individual use and includes at least a local central processing unit (CPU), a user input interface such as a touch screen, keypad, a screen with mouse, voice recognition system, or penbased input, etc., memory for storing information, and input/output capability for reading and writing information. The I/O capability may be to various cards such as smart cards, magnetic cards, or optical cards, etc. The PDA may also include a microphone, a modem, a serial port and/or a parallel port so as to provide direct communication capability with peripheral devices, e.g., point of sale (POS) and automated teller machine (ATM) terminals, and capability for transmitting or receiving information through wireless communications such as radio frequency (RF) and infrared (IR) communications. Examples of PDAs are an International Business Machine (IBM) Workpad® or an Apple Newton®.

A "financial institution" is defined as any institution for receiving, lending, exchanging and safeguarding money, issuing notes and transacting other monetary business. For example, banks, credit card companies, brokerages, etc.

A "transaction processor" or "store" is any establishment in that receives payment for products, services, etc., and is not limited to a traditionally defined store. For instance, internet commerce, websites, ATM machines, stock markets or brokers, car rental companies, etc., are all considered "transaction processors" or "stores." In some instances, the establishment may be both a store and a financial institution, e.g., stock brokers.

Referring to Fig. 1, a PDA based financial transaction system in accordance with the subject invention. The system includes a personal digital assistant (PDA) 10 such as an IBM Workpad®. PDA 10 is communicative via mechanism 12 to a transaction processor's or store's computer system 20 and, in particular, to any one of a number of communication ports or kiosks 14A, 14B, 14C, 14D, 14E, etc. that may be positioned anywhere throughout a store. Communication mechanism 12 can take a variety of forms that allow electronic communication. For instance, wiring. If PDA 10 has wireless communication capabilities, then communication mechanism 12 may include a compatible receiver/transmitter 16, e.g., an infra-red data communication port.

Store computer system 20 would include a CPU, ROM, RAM and assorted input/output devices. Store computer system 20 would also include networked kiosks 14A-14E. Store computer system 20 can also electronically connect, e.g., via modem or wide area system, to any number of financial institution computer systems 30, 32, 34 in which the PDA user and/or store has at least one account.

Turning to figs. 2-3, the overall processes involved in the operation of the system are illustrated. In step S1 of fig. 2, PDA 10 initiates payment transfer at a conveniently located kiosk 14A-14E in the store. That is, PDA 10 is electronically communicative with store computer system 20 via wired or wireless communication via kiosk 14A-14E. At this point, payment information such as the cost of the product or services is entered. This information may be inputted into either PDA 10, or store computer system 20 directly via kiosk 14A-14E, in a number of ways. For instance, the price can be entered via a keyboard or more preferably via conventional bar code reader scanning. Once a final financial transaction total has been obtained, it is reported to the PDA 10 user, i.e., if inputted into a kiosk 14A- 14E, kiosk 14A-14E transfers the transaction amount to PDA 10.

In step S2, the PDA user chooses the financial account or accounts and amount to debit from each to cover the amount of the financial transaction. The financial account(s) can be at a single financial institution or a number of financial institutions. The selections would be presented on the output device of PDA 10 and selectable by the user as desired. For instance, PDA 10 may include a touch screen, a screen with mouse, a pen-based system, a keypad, or voice recognition system, etc., for item selection by the user. Input of amounts to be debited to each financial account could be provided with the same selection mechanisms.

In step S3, a determination as to whether the financial transaction amount has been covered by the selections is performed. If the transaction is incomplete, the process loops until selections are made by the PDA user to cover the total amount of the financial transaction. If the final transaction total has been covered by the selections, the process proceeds to step S4 where a user enters an account access approval indication such as passwords, personal identification numbers (PIN), voice recognition approval, etc., for each account selected to be debited. The store may also have in memory an account access approval indication for each of its accounts that would be accessed for transfer to the respective financial institution.

In step S5, account accessing and communication processes with financial institution computer system(s) 30, 32, 34, etc. by an executing computer system, are illustrated. The financial institution computer systems 30, 32, 34, etc. access is determined, in part, by which financial institution accounts the PDA user designates to be debited and also by which financial institution accounts the store designates to access. For example, if the store and PDA user have accounts at the same financial institution, a minimum of two accounts will be accessed, or if the store and PDA user each designate more than one account at more than one financial institution, a minimum of four accounts may be accessed. Communication with each financial institution is to be in parallel such that simultaneous electronic financial transactions can occur. It is important to note, however, that membership in standardized financial transaction programs, e.g., CIRRUS®, MAC®, NYCE®, etc., could reduce the necessary number of financial institutions accessed.

The executing computer system may be either store computer system 20, PDA 10 or financial institute computer 30, 32, 34, etc., i.e., software execution for the actual financial transaction may take place in any system. Preferably, however, the executing computer system would be either financial institute computer system 30, 32, 34, etc. or store computer system 20 based on their probable higher storage capacity and performance parameters as compared to PDA 10. Most preferably, store computer system 20 is the executing computer system.

Referring to Fig. 3, the details of step S5 are illustrated. At step S6, financial institution computer system 30, 32, 34 receives a request for transaction from the executing computer system, e.g., PDA 10 or store computer system 20. This request(s) would include the inputted account access approval indications for each account to be accessed. As is conventional, all information communicated is encrypted. For instance, a 128 bit encryption key, dynamic encryption system (DES), etc. can be used to assure security. Alternatively, a secure virtual private network system (VPN) is also possible.

In step S7, financial institution computer system(s) 30, 32, 34 receive encryption keys from PDA 10 and store computer system 20. In step S8, the encryption keys are returned or transmitted to PDA 10 and store computer system 20.

In step S9, the current account(s) information is transmitted to PDA 10. This information advantageously would include at least current account(s) balance(s) and possibly all past transactions, i.e., account transaction history, which may or may not have been recorded by the PDA user. If account transaction history is desired, the number of days, weeks, months, etc. of history to be obtained can be set by the PDA user. Hence, the user can be apprized of current account balances and, if desired, determine paper transactions that have not yet cleared by reviewing the account transaction history. These provisions allow the PDA user to have the most up to date information before completing any final transactions. In a preferred embodiment, PDA 10 includes a financial account tracking database that is used to maintain and track financial accounts activity and balances. This database would be updated by the current account(s) information. However, it is also possible that at the PDA user's choosing (e.g., for security reasons), PDA 10 would not have information stored thereon and all account information would be transferred from the financial institution(s) upon use. In this case, PDA 10 would act as a terminal. Information regarding a store account(s) can also be sent to store computer system 20, if desired.

In step S10, the encrypted transaction parameters are received by financial institution computer system(s) 30, 32, 34. Transaction parameters may include, for example, transaction amount, account information, type of transaction (e.g., debit, transfer, credit), etc. Further, for some transactions, such as those requiring financial status verification (e.g., mortgages, car loans, etc.), other PDA user account information could be transferred to the store.

In step S11, a return commit request is sent to PDA 10 for a two-step or two-phase transaction committal from the PDA user. It should be recognized that the committal does not necessarily have to require two

phases and may take the form of any committal indication desired by the PDA user, store and/or financial institution. For instance, a password or PIN, voice recognition, handwriting recognition, alphanumeric signal, etc. can be used.

In step S12, the financial transaction is performed. More specifically, the committal confirmation from PDA 10 is received and the financial transaction is performed. That is, the amount(s) selected from each financial account(s) of the PDA user to cover the amount of the financial transaction is transferred to the designated store account(s).

Next, in step S13, a transmittal from each financial institution to PDA 10 of updated information regarding each financial account is provided. In particular, a completed transaction notification is sent back to PDA 10 with the current account(s) information of the PDA user. After step S13, connection between store computer system 20 and the financial institution computer system(s) 30, 32, 34 can be discontinued.

Returning to fig. 2, the overall process continues with step S14 where current account(s) information is transferred back to PDA 10 via store computer system 20 connection with PDA 10, assuming store computer system 20 is the executing computer. Otherwise, current account(s) information is sent directly to PDA 10. In step S15, the account(s) information is displayed on PDA 10 and the financial transaction is applied to a PDA database to update its records if PDA 10 has such capabilities. Hence, an automatic account register can be created. In step S16, the PDA user is queried as to whether more transactions are desired. If yes, the system loops back to step S2. Otherwise, the process is completed.

As an additional last step (not shown), an encrypted receipt could be sent to PDA 10 for further record keeping and presentation to a store representative prior to departure. As an alternative, a receipt could also be printed at kiosks 14A-14E for presentation to a store representative upon departure or at a pick up area within the store.

The method and process described above allow access to financial account(s) with immediate updated feedback from the financial institution(s) accessed. This allows the user to access one account or more than one account at one time, if necessary, and immediately see updated account balances on PDA 10. For example, if a user were buying a $1000 television, $500 could be debited to a checking account, $200 to a savings account, and $300 to a Visa account simultaneously. The balances of each account would be presented to the PDA user prior to completion of the transactions and after completion of the transactions. The user therefore receives more accurate account information. Additionally,

prior to proceeding with a financial transaction, the PDA user is provided with current financial account information so as to prevent overdrafts. A transaction processor or store, such as a retail institution, would receive immediate payment for goods or services. Further, the transaction processor or store could potentially eliminate the need for checkout clerks or other service representatives other than someone to check receipts of a PDA user upon departure from the store. Alternatively, paper receipts could be eliminated entirely, for example, by providing an electronic receipt displayed on the PDA for presentation to a store representative upon departure. Hence, the invention could drastically decrease store operation costs.

While this invention has been described in conjunction with the specific embodiments outlined above, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. For instance, the invention can be implemented as set(s) of instructions (i.e., a software program) resident in the read only memory (ROM) of the executing computer system, e.g., PDA 10, store computer system 20 or financial institution computer system 30, 32, 34, etc. Alternatively, the set of instructions can be segmented between computer systems 10, 20, 30, etc. as necessary.

Until required, the set of instructions may also be stored in another computer readable memory, for example in a hard disk drive, or in a removable memory such as an optical disk for eventual use in a CD-ROM drive or a floppy disk for eventual use in a floppy disk drive. Further, the set of instructions can be stored in the memory of another computer and transmitted over a local area system or a wide area system, such as the Internet, when desired by the user. For instance, the set(s) of instructions may be stored in financial institution computer system(s) 30, 32, 34, etc. If the Internet is used, the set(s) of instructions can be transferred directly to the executing computer system, i.e., PDA 10 or store computer system 20, as necessary. One skilled in the art would appreciate that the physical storage of the set(s) of instructions physically changes the medium upon which it is stored electrically, magnetically, or chemically so that the medium carries computer readable information.

Furthermore, the idea of immediately updating a PDA financial account database after a financial transaction may be applied in circumstances other than a debiting-type financial transaction. For instance, it may be used for account transfers, e.g., transferring more funds between accounts or to a smart card. Transfers could occur prior to a debiting financial transaction, e.g., after the PDA user receives the current account information, or without a debiting financial transaction occurring. Further, it could be used for situations where

the establishment is both a financial institution and store as defined herein, e.g., a sale of stock by the PDA user, with transfer of proceeds to other accounts at the stock brokers or elsewhere.

CLAIMS

1. A method comprising the steps of:

a) accessing at least two financial accounts at at least one financial institution using a hand held computer;

b) performing at least one financial transaction during accessing using the hand held computer; and

c) transmitting from each financial institution to the hand held computer updated information regarding each financial account.

2. The method of claim 1, wherein the step of accessing at least two financial accounts further includes accessing at least two financial institutions.

3. The method of claim 1 or 2, wherein the step of accessing includes accessing a store financial account at a store financial institution.

4. The method of claim 1, 2 or 3, wherein the step of accessing includes the hand held computer communicating with the financial institution via a store computer system.

5. The method of claim 4, wherein the step of transmitting includes transmitting the updated information to the hand held computer via the store computer system.

6. The method of any preceding claim, further comprising the step of entering a transaction amount into one of the hand held computer and the store computer system.

7. The method of claim 6, wherein the step of entering includes scanning a bar code that signifies a transaction amount.

8. The method of any preceding claim, wherein the step of accessing includes transmitting from the financial institution to the hand held computer current account balances.

9. The method of any preceding claim, wherein the step of performing a financial transaction includes transferring a transaction amount to a store account.

10. The method of any preceding claim, further including the step of updating a database of the hand held computer with the updated information regarding each financial account.

11. A financial transaction system comprising:

a hand held computer electronically communicative with a store computer, the store computer being electronically communicative with at least one financial institution computer;

means for executing at least two substantially simultaneous electronic financial transactions between at least two financial accounts of the user of the hand held microcomputer at the at least one financial institution and a store account; and

means for substantially immediately providing the hand held microcomputer with updated account information after the electronic financial transactions have been completed for each account.

12. The system of claim 11, wherein the means for executing the at least two simultaneous electronic financial transaction includes a software program executable by any one of the hand held microcomputer, store computer or financial institution computer.

13. The system of claim 12, wherein the software program is executable by the store computer.

14. A computer program product comprising a computer-readable storage device containing code executable by a computer to effect a financial transactions between computer systems by:

a) accessing at least two financial accounts at at least one financial institution using a hand held computer;

b) performing at least one financial transaction during accessing using the hand held computer; and

c) transmitting from each financial institution to the hand held computer updated information regarding each financial account.

Application No: GB 9929934.9 **Examiner:** Michael Logan
Claims searched: All **Date of search:** 16 June 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): G4V (VAK)

Int Cl (Ed.7): G06F 17/60; G07F 7/08, 7/10, 19/00

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0640945 A2	(AT & T) see especially column 28, lines 20-30, and column 30, line 55 - column 31, line 39	1,11
X	WO 97/31343 A1	(LABOURGADE) see page 6, lines 19-34	1,4-6,8,10 11-14
X	WO 96/18162 A1	(PROPRIETARY FINANCIAL PRODUCTS) whole document relevant	1-14

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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